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# U.S. ARMY ADVANCED CONSTRUCTION TECHNOLOGY FELLOWSHIP PROGRAM

FINAL REPORT  
to the  
ARMY RESEARCH OFFICE  
on  
GRANT NO. DAAL03-86-G-0188

Advanced Construction Technology Center  
University of Illinois at Urbana-Champaign  
Urbana, Illinois

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13. ABSTRACT (Maximum 200 words)

This is a report of the Fellowship Program conducted by the University of Illinois Advanced Construction Technology Center. The program was in effect from October 1, 1986 to September 30, 1992. During that time, thirty-five American graduate students were appointed to the program and designated U.S. Army Advanced Construction Technology Fellows. These fellows participated in the Research Program of the Center, while completing their graduate studies.

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## INTRODUCTION

This is a report of the Fellowship Program conducted by the University of Illinois Advanced Construction Technology Center. The program was conducted in accordance with the provisions of the Army Research Office Grant No. DAAL03-86-G-0188, Proposal No. 24607-E-G-UIF; Advanced Construction Technology Center. The grant was effective from October 1, 1986 to September 30, 1992. During that period, select American graduate students were appointed to the program and designated U.S. Army Advanced Construction Technology Fellows. These Fellows participated in the program of the Advanced Construction Technology Center, a center of excellence established under Grant Nos. DAAL03-87-K-0006 and DAAL03-86-G-0186. The Research Program of the Center consisted of twenty-eight projects grouped into five thrust areas. Each of the Fellows was assigned to work with one of the projects in the Center. The thrust areas in which the Fellows worked are as follows:

Nondestructive Evaluation Technologies for Constructed Works  
Construction Site Metrology  
New Materials and Material Technologies for Construction  
Computer-Aided Construction  
Special Technologies

The important results from the research in these thrust areas have been reported separately.

## LIST OF PARTICIPATING SCIENTIFIC PERSONNEL (Fellows)

<u>Name</u>	<u>Department</u>	<u>Degree</u>	<u>Year</u>
Anderson, Michael	Ceramics	MS	1989
Biggar, John	Architecture	MS	1989
Bills, Richard E.	ECE	MS	1988
		PhD	1991
Breslin, John	CE	MS	1989
Carson, Robert T.	Mat. Sci.	MS	1990
Davison, William W.	Ceramics	PhD	1989
Eckhoff, Mark	CE	MS	1988
Elam, Steve	CE	PhD	1988
Epperson, Gary	CE	MS	1989
Fancher, Nannette	CE	MS	1989
		PhD	1993*
Friedrich, James	ECE	MS	1991

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Geisler, Wilson S.	CE	MS	1990
Genis, Patrick	ECE	MS	1988
		PhD	1990
Gilbert, Robert	CE	MS	1988
Goodin, Anthony	CE	MS	1988
Gustafson, Bradley K.	MIE	MS	1987
Hebner, Gregory A.	ECE	PhD	1987
Hendron, Michael A.	CE	PhD	1993*
Koestner-Norvell, Wendy	MIE	MS	1989
Larson, Gregg E.	CE	MS	1988
		PhD	1993*
Lew, Michael S.	ECE	MS	1990
		PhD	1992*
Mast, Jeffrey	ECE	MS	1989
		PhD	1992*
McKinley, Philip K.	Comp. Sci.	PhD	1989
Miller, James P.	MIE	MS	1988
Murphy, Craig**	Comp. Sci.		
Nygaard, Russell A.	CE	MS	1989
Rienhart, Thomas	CE	MS	1991
Sieczkowski, William F.	CE	MS	1989
Thompson, James B.	MIE	PhD	1990
Touse-Schunkwiler, Sara	Ceramics	MS	1989
Twardock, Robert	CE	MS	1988
Wagner, Robert L.	ECE	MS	1991
Wavering, Matthew	MIE	MS	1989
Yannakakis, Elias J.	ECE	MS	1989
Zehrt, William H.	CE	MS	1987

\* Expected completion date

\*\* resigned Fellowship

## LIST OF PUBLICATIONS

### THESES:

ANDERSON, M.W. Incorporating the sol-gel process into the manufacture of lightweight fly ash building material. M.S thesis, G.P. Wirtz, advisor (1989).

BILLS, R.E. An advanced lidar data acquisition system. M.S. thesis, C.S. Gardner, advisor (1988).

- BILLS, R.E. Ion and sodium doppler/temperature lidar studies of the upper mesosphere. Ph.D. thesis, C.S. Gardner, advisor (1991).
- CARSON, R.T. Microchemical and electrochemical characterization of ion plated titanium nitride. M.S. thesis, J.M. Rigsbee, advisor (1990).
- DAVISON, W.W. Processing and phase stability of metal carboxylate derived barium-yttrium-copper oxide thin films. Ph.D. thesis, R.C. Buchanan, advisor (1990).
- ELAM, S.L. Knowledge based approach to checking designs for conformance with standards. Ph.D. thesis, L.A. Lopez, advisor (1988).
- EPPERSON, G.S. NDE of masonry buildings. M.S. thesis, D.P. Abrams, advisor (1989).
- FANCHER, N. Stress wave scattering in concrete: An investigation through simple finite element models. Ph.D. thesis, J.P. Murtha, advisor (1993\*).
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GOODIN, A.C. and L.T. BOYER. Identification and measurement technologies applicable to construction. Fourth International Symposium on Robotics and Artificial Intelligence in Building Construction, Haifa Israel, June 1987.

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MCKINLEY, P.K. and J.W.S. LIU. Group communication in interconnected bus networks. Phoenix Conference on Computers and Communications, Scottsdale, Arizona, March 1989.

THOMPSON, J.B. and S.C-Y. LU. A design model to support design evolution management. American Association of Artificial Intelligence-90 Workshop on Concurrent Engineering, Boston, Massachusetts, July-August 1990.

KAPOOR, S.G. and M.D. WAVERING. A robotic assembly cell for precast reinforcement cages. Sixth International Symposium on Automation and Robotics in Construction, San Francisco, California, June 1989.

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\* expected completion date.